DCS Nos.	841022	841012
	850114	820629
	830708	840517
	831212	841130

U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Report No. 50-334/85-02

Docket No. 50-334 License No. CPR-66

Licensee: Duquesne Light Company
One Oxford Center
301 Grant Street
Pittsburgh, Pennsylvania 15279

Facility Name: Beaver Valley Power Station, Unit 1

Location: Shippingport, Pennsylvania

Dates: January 8 - February 19, 1985

Inspectors: Wm. Troskoski
W. M. Troskoski, Senior Resident Inspector 2/22/85 date

Wm Troskoski / for
D. M. Johnson, Resident Inspector 2/22/85 date

Approved by: J. E. Tripp
J. E. Tripp, Chief, Reactor Projects Section No. 3A, Reactor Projects Branch 3 3/4/85 date

Inspection Summary: Inspection No. 50-334/85-02 on January 8 - February 19, 1985.

Areas Inspected: Routine inspections by the resident inspectors (192 hours) of licensee actions on previous inspection findings, plant operations, housekeeping, fire protection, radiological controls, physical security, ESF verification, surveillance activities, maintenance activities, periodic reports and information notice review.

Results: Two violations were identified (failure to test check valves in accordance with ASME Section XI - detail 3.b, and failure to specify the use of only QA Category I components to meet technical specification minimum volume requirements for the boric acid storage system - detail 3.f).

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DETAILS

1. Persons Contacted

J. J. Carey, Vice President, Nuclear Group
R. J. Druga, Manager, Technical Services
K. D. Grada, Manager, Nuclear Safety
T. D. Jones, General Manager, Nuclear Operations
W. S. Lacey, Plant Manager
J. D. Sieber, General Manager, Nuclear Services
N. R. Tonet, General Manager, Nuclear Engineering & Construction Unit

The inspectors also contacted other licensee employees and contractors during this inspection.

2. The NRC Outstanding Items (OI) List was reviewed with cognizant licensee personnel. Items selected by the inspectors were subsequently reviewed through discussions with licensee personnel, documentation reviews and field inspection to determine whether licensee actions specified in the OI's had been satisfactorily completed. The overall status of previously identified inspection findings were reviewed, and planned and completed licensee actions were discussed for those items reported below:

(Closed) Inspector Follow Item (81-BU-03): Flow blockage of cooling water to safety system components by Asiatic clams. By letter dated January 14, 1985, DLC responded to the Division of Licensing, NRR, letter entitled "Survey Questions On Nuclear Power Plant Biofouling," dated October 22, 1984. In the letter, the licensee noted that NUREG CR-3054 dated June, 1984, placed BVPS Unit 1 in the "Unit with High Biofouling Potential." An inspection made during the fourth refueling outage indicated that the existence of corbicula found in the cooling tower basic silt was less than had been experienced in the past. Based on detection and prevention methods previously outlined, it is not believed that these organisms appear to pose a serious biofouling threat, and the inspector discussed this with the Licensing Project Manager, NRR. Because it was concluded that BVPS Unit 1 is not now considered a high risk plant, this item is closed.

(Closed) Inspector Follow Item (82-BU-02): Degradation of threaded fasteners in the reactor coolant pressure boundary of PWR plants. This item was last reviewed in NRC Inspection Report 50-334/83-08 and left open pending completion of the licensee required inspections scheduled for the third refueling outage. The inspector reviewed the DLC letter of December 12, 1983, to the NRC that provided the results of these inspections, and selectively reviewed the Quality Control visual inspection reports to verify the accuracy of the data reported. No discrepancies were identified. Additionally, master copies of preventive maintenance and corrective maintenance procedures (PMPs, CMPs) were reviewed to verify that program changes have been implemented in accordance with the licensee's inspection commitments. This item is closed.

(Closed) Unresolved Item (82-16-05): Review corrective action to limit future solid waste contamination problems. This item was open to track licensee action taken to limit potential contamination problems in the solid waste area of the Primary Auxiliary Building, due to inadequate space for personnel to remove contaminated anti-C's. A station modification was made in December, 1983, that added a new platform, ladder and handrailing in the solid waste area. No further problems of a similar nature have occurred since. As the modification appears to be effective, this item is closed.

(Closed) Unresolved Item (82-16-07): Investigate failure of component cooling water pumps. This item was open to track licensee corrective action after three instances (LER 81-103, 82-22 and 82-24) whereby two of the three component cooling water pumps were simultaneously out of service due to pump/motor misalignment problems. The inspector reviewed the maintenance work history for the three CCR pumps for 1983 thru the end of 1984. Since no other mechanical failures occurred in these two years, it appears that the corrective action consisting of motor shaft realignments has been effective in preventing recurrence. This item is closed.

(Closed) Inspector Follow Item (82-19-04): Followup on audit of QA Program for Shipping Packages. Discussion of this item could not be found in the subject inspection report and is therefore, administratively closed.

(Closed) Inspector Follow Item (82-24-02): Licensee to revise the Nuclear Division Training Manual to include requirements of ANSI 3.1 for the licensed operator requalification program. The inspector reviewed Issue 3, Revision 7, to the Nuclear Division Training Manual and verified that the 27 control manipulations specified in ANSI-3.1 were to be included in the licensed operator requalification training. The inspector also reviewed the proposed Nuclear Group Training Administrative Manual, Volume 2, which is to replace the Nuclear Division Training Manual by March, 1985, and verified that the simulator training requirements have been included in the new manual. This item is closed.

(Closed) Inspector Follow Item (82-24-03): Licensee to provide information relative to number and location of pipes carrying radioactive fluid used in shielding calculations. In a previous inspection of the licensee's shielding design review verification for post-accident operation, it was determined that the assumptions used were consistent with the guidelines of NUREG 0737 and the methodology employed state of the art mathmetical models. However, the basis for the number and locations of radioactive fluid carrying pipes used in the calculations were not available for review. The inspector verified that this information had been provided to the licensee by their contractor and is in the Licensing and Compliance Group's files. Because no concerns were previously identified in this area, no further inspection is planned. This item is closed.

(Closed) Unresolved Item (83-07-04): Licensee to develop a matrix that relates all technical specification surveillance requirements to an appropriate procedure. The Nuclear Safety Division has developed the subject matrix that correlates all technical specification surveillance requirements by individual paragraph numbers to the appropriate procedure; OST, BVT, MSP, Operating Manual Log, Chemistry Manual Procedure or Rad-Con Manual Procedure. The frequency of performance is listed, as well as the mode of operation requiring the performance of the surveillance. The inspector reviewed selected portions of the matrix that is maintained up-to-date by the Nuclear Safety Department, with the latest change to the Technical Specifications to verify that the referenced procedures adequately address the corresponding technical specification surveillance requirement or administrative action was being implemented to update the required procedures. No discrepancies were noted and this item is closed. Additional action to implement administrative controls assigning responsibilities and Quality Assurance involvement to maintain the matrix and ensure that appropriate procedures are updated is being tracked as Unresolved Item (83-25-02).

(Closed) Unresolved Item (83-08-01): Licensee to verify that Operational Surveillance Test (OSTs)cover sheets accurately reflect actual Technical Specification requirements. The licensee completed preparation of the Technical Specification versus surveillance procedure matrix. During the preparation of the matrix, numerous errors in the OST cover sheets where the appropriate technical specification is referenced were discovered and corrected by procedure changes. Additional action to implement administrative controls to ensure that the technical specification/procedure matrix functions are kept current when procedures are updated is being tracked as Unresolved Item (83-25-02). Item (83-08-01) is closed.

(Closed) Unresolved Item (83-10-01): Review corrective action to ensure that technical specification surveillance testing is performed at the required frequency. OST 1.16.5, Fuel Building Ventilation System Verification, had not been performed on a 31 day frequency in the month of April, 1983, as required by Technical Specification 4.9.13. Subsequently, Station Administrative Procedure SAP-4, Section VI-Z was revised to redefine the responsibilities and actions for station operations personnel concerning the performance of surveillance tests (OSTs) to ensure that they are accomplished within the required time frame.

Through review of the posted OST schedule in the Control Room, review of completed OSTs as accomplished on a routine basis by the inspectors, and discussions with senior reactor operators, it was verified that the increased management attention given to scheduling of surveillance testing and the additional controls required by SAP-4 Section VI-Z have resulted in an acceptable performance in the area of surveillance testing. The inspector had no other concerns at this time and this item is closed.

(Closed) Unresolved Item (83-10-03): Review effectiveness of feedwater regulator valve modification. DCP 588, Feedwater Regulator Valve Modification, was completed and accepted by the station on September 15, 1983. This modification added a cage guided multistage pressure reduction Hush II trim to reduce flow instabilities in the valve body, and provided guide assemblies to minimize the diaphragm assemblies rocking motion. As no other valve stem failures occurred during the last cycle, it appears that these modifications have been effective in eliminating the effects of flow induced vibration. This item is closed.

(Closed) Unresolved Item (83-19-05): Provide double verification for restoration to normal alignment for 18 month OSTs or verify performance of these OSTs prior to system lineups for plant startup. These procedures were reviewed as part of the close out of Unresolved Item (84-04-01), concerning the same issue, which was discussed in Inspection Report 50-334/84-20. As action is already complete, this item is closed.

(Closed) Unresolved Item (84-10-01): Update Nuclear Division Training Manual and individual training files. The inspector reviewed the proposed Nuclear Group Training Administrative Manual, Volume 2, Programs, to verify that Section 3, Radiological Controls Training, contained a description of the site specific training that is given to contract radiological control personnel employed at BVPS Unit 1. This manual, which will replace the Nuclear Division Training Manual, is scheduled to be issued by March, 1985. The inspector also reviewed selected individual training records from the Class 3 Radiological Controls Technician Program to verify that individuals who had completed training in appropriate procedures had signed off for these procedures in their individual files. When all required procedures were completed by an individual, the appropriate signoff was made by supervisory personnel on the individual's master qualification sheet. No discrepancies were identified and this item is closed.

(Closed) Unresolved Item (84-12-06): Review limitorque MOV setpoint controls program. To ensure that limitorque switch settings are returned to the as found condition after any maintenance activity, CMP 1-75-79, Limitorque Motor Operator Repair Maintenance, Revision 4, was updated to provide a table of the various MOV torque switch settings. The procedure also provided steps for recording the as-found and as-left torque switch settings and instructions to the mechanic for obtaining an engineering resolution of any setting found outside of the table listings. This satisfactorily addresses the inspector's concerns and the item is closed.

(Closed) Unresolved Item (84-26-01): Resolution of magnetic particle indications. In reviewing weld PS-60-FW21 on the low head safety injection system, the liquid penetrant test reported numerous "false" indications observed due to the as-welded condition. The inspector verified that the weld surface appeared to be condusive to producing a powder buildup and took the position that the indication should be further addressed to ascertain that they were not masking relevant flaw indications. As this is a generic problem applicable to many system welds, the licensee choose a worst case weld, No. 44 on main steam line A. From a review of ISI Surveillance No. 15 conducted on November 3, 1984, the inspector determined that this area was prepared by power wire brushing and then re-examined in accordance with the same technique and procedure used during the initial examination. No indications were noted as reported on the visual surveillance data sheet. Discussions with the NRC Regional specialist indicated that the concern had been satisfactorily addressed by the licensee. This item is closed.

(Closed) Unresolved Item (84-26-02): Audit of Babcock and Wilcox acceptability as qualified ISI vendor. The licensee is required to perform a QA audit of all vendors on the DLC Qualified Supplier List (QSL) at least once per 18 months to verify that the services or goods are provided in accordance with the vendor's quality assurance program. Because of the diversity of services offered by B&W, and the number of offices involved, DLC performs one audit for all services used at each address. It appears that a problem occurred when the ISI services of B&W were added to the QSL without performance of a DLC QA audit because other services performed at that location had just been audited. Consequently, the licensee missed the initial audit of the ISI program. This audit was subsequently performed on November 7, 1984, with acceptable results. To prevent recurrence, separate listings are now provided for each service on the QSL.

During review of this item, the inspector noted that a problem could occur if a vendor is removed from the QSL while issued purchase orders are still outstanding. To address this concern, the licensee's Quality Assurance representative stated that the following would be accomplished:

(1) Revise Quality Assurance Instruction Number 7.1.1, Paragraph 4.4.1.1 by adding the following:

> Additionally, the Quality Assurance Unit purchase order records shall be examined to determine if there are any open or in-progress purchase orders extending beyond the previous 18-month period.

(2) The Quality Assurance Unit will contact the appropriate Duquesne Light Company organizations to determine if there are any open or in-progress purchase orders with vendors removed from the QSL from January to March, 1985.

(3) The Duquesne Light Company Purchasing Department will institute a new computer program in the near future, approximately March 1, 1985, which will list a vendor, purchase orders issued to him, and the QA Category. The program will also indicate the status of the purchase orders as open or closed. The Quality Assurance Unit will review a monthly computer run of this program for all vendors being re-evaluated during any given month to determine if there are any open or in-progress purchase orders for vendors under consideration for removal from the QSL.

The inspector determined that the above solution satisfactorily addresses the concern. This item is closed.

(Open) Unresolved Item (84-25-05): Review QC program changes regarding resolution of nonconformance reports. Currently, there are two separate QC programs employed at BVPS Unit 1, that come under separate QA programs: one for installed station equipment, run by DLC, and another for design changes and modifications, run by a contractor for DLC. Each program uses a different control system to disposition items identified as adverse to quality. It appears that the contractor's system may not always disposition those items in a timely manner because their system cannot require DLC to provide a required engineering resolution within a fixed schedule. Further discussions with the licensee's representatives indicated that program changes were scheduled to be implemented by about May 1, 1985, whereby, all QC work at BVPS Unit 1 would be performed to the same program controls. This item remains open pending inspector review of those changes.

3. Plant Operations

a. General

Inspection tours of the plant areas listed below were conducted during both day and night shifts with respect to Technical Specification (TS) compliance, housekeeping and cleanliness, fire protection, radiation control, physical security and plant protection, operational and maintenance administrative controls.

-- Control Room
-- Primary Auxiliary Building
-- Turbine Building
-- Service Building
-- Main Intake Structure
-- Main Steam Valve Room
-- Purge Duct Room
-- East/West Cable Vaults
-- Emergency Diesel Generator Rooms
-- Containment Building
-- Penetration Areas
-- Safeguards Areas
-- Various Switchgear Rooms/Cable Spreading Room
-- Protected Areas

Acceptance criteria for the above areas included the following:

-- BVPS FSAR
-- Technical Specifications (TS)
-- BVPS Operating Manual (OM), Chapter 48, Conduct of Operations
-- OM 1.48.5, Section D, Jumpers and Lifted Leads
-- OM 1.48.6, Clearance Procedures
-- OM 1.48.8, Records
-- OM 1.48.9, Rules of Practice
-- OM Chapter 55A, Periodic Checks - Operating Surveillance Tests
-- BVPS Maintenance Manual (MM), Chapter 1, Conduct of Maintenance
-- BVPS Radcon Manual (RCM)
-- 10 CFR 50.54 (k), Control Room Manning Requirements
-- BVPS Site/Station Administrative Procedures (SAP)
-- BVPS Physical Security Plan (PSP)
-- Inspector Judgement

b. Operations

The inspector toured the Control Room regularly to verify compliance with NRC requirements and facility technical specifications (TS). Direct observations of instrumentation, recorder traces and control panels were made for items important to safety. Included in the reviews are the rod position indicators, nuclear instrumentation systems, radiation monitors, containment pressure and temperature parameters, onsite/offsite emergency power sources, availability of reactor protection systems and proper alignment of engineered safety feature systems. Where an abnormal condition existed (such as out-of-service equipment), adherence to appropriate TS action statements were independently verified. Also, various operation logs and records, including completed surveillance tests, equipment clearance permits in progress, status board maintenance and temporary operating procedures were reviewed on a sampling basis for compliance with technical specifications and those administrative controls listed in paragraph 3a.

During the course of the inspection, discussions were conducted with operators concerning reasons for selected annunciators and knowledge of recent changes to procedures, facility configuration and plant conditions. The inspector verified adherence to approved procedures for ongoing activities observed. Shift turnovers were witnessed and staffing requirements confirmed. Except where noted below, inspector comments or questions resulting from these daily reviews were acceptably resolved by licensee personnel.

(1) On January 5, 1985, the plant operators noted that a deviation of - 15 steps between control rod F-10 RPI analog reading and the Group 2 demand counter indication. This condition was unacceptable as RPI analog indication is required to be within 12 steps of its respective group demand counter, per Technical Specification (TS) limiting condition for operation (LCO) 3.1.3.1.

Detector primary voltage was measured for control rod F-10 and a reading corresponding to a rod position of 137 steps versus a demand counter indication of 163 steps was obtained. Supply voltage was subsequently adjusted per AOP-7, Rod Position Indication Malfunction, which caused an increase in the deviation. The control rod was declared inoperable and the action required by TS 3.1.3.1.c.3 was accomplished; reactor power was already less than 75% and the high neutron flux trip setpoint was reduced to 85%.

Temporary Operating Procedure 85-1, was generated to check the alignment of F-10 by moving control bank D out to 228 steps. A trace of the stationary gripper coil current was obtained for the four rods of this group, and from the trace, it could be observed that all four rods exhibited the same inflection on the 8 ampere plateau of the stationary gripper coil trace at the 228, 229, and 230 step positions. This confirmed that F-10 was actually in the fully withdrawn position. The RPI was subsequently realigned on January 8, 1985, and F-10 was declared operable. Analysis of an incore flux map obtained at 50% power on January 7, 1985, demonstrated all core power distribution parameters were within specifications while the RPI was indicating misalignment.

RCCA F-10 was never actually misaligned from the Bank D position, and power level was maintained less than or equal to 50% while the rod indicated misalignment. The licensee concluded that a shift in the voltage characteristics of the RPI system for F-10 resulted in its output calibration indication being greater than 12 steps from actual demand position. On January 13, 1985, RCCA F-10 Analog RPI again indicated that it was greater than 15 steps from its group demand position. Similar steps were followed as described above to verify that it was in its correct position. While checking the primary voltage output for Rod F-10, plant personnel incorrectly used the wrong voltage curve which at first, implied that rod F-10 was out of position. It was later discovered that the voltage curve for zero power was used instead of the curve for "at power" operations. This curve is a special primary voltage curve for Control Bank D rods that has been generated by station test personnel, to account for primary voltage output shift that is experienced when the plant is heated up to full power conditions. When the correct curve was used, RCCA F-10 was confirmed to be in the proper position and its analog position indication was realigned to indicate correctly. Plant performance and test personnel are presently monitoring all control rod RPI primary voltage outputs to track the fact that voltage shifts have occurred on some control rods. This combination of higher primary voltages "at power" and voltage shifts over a given fuel cycle is being monitored. The inspectors will continue to follow any other analog rod position indication problems of this type. No other concerns were identified at this time. This is an open item pending licensee determination of the cause of the unexplained voltage shifts and/or subsequent review by region-based specialist inspectors (IFI 334/85-02-04).

(2) A high temperature alarm was received from the reactor vessel flange leakoff system on January 9, 1985. The inspector verified that the alarm cleared after the temperature monitoring system was realigned from the inner flange seal to the outer seal; indicating the outer seal was functioning properly. Appropriate control room prints were modified to reflect the new alignment.

(3) A reactor trip and safety injection occurred at 15:31 hours on January 16, 1985, with the reactor initially operating at 96% power. The reactor trip was preceeded at approximately 15:23 hours by receipt of various alarms on Channel 3 annunciators, followed by indication of all three feedwater regulating valves going to the full open position. While attempting to restore steam generator water level, the operators overfed the B steam generator causing an excessive level shrink which resulted in a reactor trip from low steam generator water level (25%) combined with a feed flow/steam flow mismatch. It was later determined that Breaker 3-3 on the vital bus distribution panel had tripped open, resulting in loss of power to process protection racks 14 thru 18. This loss of power resulted in the loss of feed regulating valve control signals. Approximately one second after the reactor trip, a safety injection signal was generated from SG low steam pressure. Although the recorder traces indicate that SG pressure only decreased to approximately 700 psi, the lead-lag characteristics employed in the initiation circuit for the low steam pressure SI, resulted in an actual signal. All equipment and systems associated with a safety injection signal actuated as designed. After operators verified that plant parameters were satisfactory, the SI and CIA signals were reset and equipment returned to normal.

Due to the fact that both hi-head charging pumps were running for approximately 15 minutes during the transient, approximately 5,000 gallons of borated water was injected into the plant. During the transient, the reactor coolant system was cooled down below normal temperature (540^{o}F) due to the injection of cold water from the RWST and subsequent feeding of steam generators after the trip to restore steam generator water level. Plant operators were able to control pressurizer level using steam dump valve operations to reduce the rate of temperature rise from decay heat.

The inspector reviewed selected recorder traces of important plant parameters to verify that the plant responded as designed. All safety systems functioned normally as verified by inspector observation. Reactor trip breakers opened within the required time frame (4 cycles) after the initial trip signal. The breaker for circuit 3-3 on vital bus No. 3 was replaced and the plant was restarted on January 17th at approximately 0700 hours. The inspector had no concerns at this time.

(4) The reactor was manually shut down from full power at 0330 hours on January 24, 1985, in response to an eight gallon per minute reactor coolant system leak rate on the A RCP seal injection line. Because the 1A lower radial bearing and seal leak-off temperatures reached approximately 200-210F, the A RCP was tripped. No changes were observed on containment radiation monitors RM-215A and B. However, containment sump pump flow rates increased to 8 gpm and remained there until seal isolation valve MOV-CH-308A was closed.

A subsequent containment entry identified the source of leakage as a failed packing follower on the A RCP seal supply isolation valve (CH-184, a 2 inch Rockwell T-58 globe valve).

An unusual event was declared at 0343 hours due to the high unidentified RCS leak rate. The unusual event was terminated at 0458 hours, after the leak was isolated. The inspector independently reviewed plant parameters and verified that all safety limits were maintained. No concerns were identified.

(5) The main plant computer (P-250) became inoperable on January 30, 1985. One of its functions is to continuously monitor the delta flux in the reactor core and to provide an alarm to alert the operator when the axial flux difference is outside of the target span. Technical Specification 4.2.1.1.b requires the indicated axial flux difference for each excore channel to be logged at least one per hour for the first 24 hours, and then once per 30 minutes thereafter when the axial flux difference monitor alarm is inoperable. Adherence to this requirement was verified by the inspector during routine control room tours until P-250 became operable on February 1, 1985.

(6) Technical Specification Limiting Conditions for Operation 3.4.6.3 requires the reactor coolant system pressure isolation valves (SI-10, 11, 12, 23, 24, and 25) to be operable when in Modes 1 thru 4, as proven by successful completion of valve leak rate tests. Technical Specification Surveillance 4.0.5 requires that ASME Code Class I, II, III components must be tested in accordance with Section XI of the ASME Boiler and Pressure Vessel Code, except where specific written relief has been granted by the Commission.

The licensee's Inservice Test Program, as approved by NRC Division of Licensing letter of June 29, 1982, and subsequently reaffirmed in a DLC response to a Regional request for additional information dated May 17, 1984, does not request relief from the test requirements imposed by IWV-3420 on the RCS pressure isolation valves or accumulator check valves. IWV-3420 requires that when check valve seat leakage tests are made at a pressure lower than the function maximum differential pressure, then the observed leakage must be adjusted to the maximum differential pressure value by calculation appropriate to the test media and the ratio between test and function differential assuming leakage to be directly proportional to the pressure differential to the one-half power. It further states that valve seat leakage may be determined by: (1) pressure testing the line and measuring leakage thru a downstream telltale connection; or (2) by measuring feed rate required to maintain pressure. Inspector discussions with licensee personnel indicated that such testing was performed during the fourth refueling outage per OST 1.11.4, Accumulator Check Valve Leak Test, and OST 1.11.16, Leakage Testing RCS Pressure Isolation Values.

Review of completed surveillance tests indicated that the RCS pressure isolation check values were tested at a differential pressure of about 350 psig, without adjusting the observed leakage to the functional maximum differential pressure value as required by IWV-3420. The failure to do so is an example of a violation of Technical Specification 4.0.5 (334/85-02-01).

Licensee representatives informed the inspector that a subsequent review in this area determined that the original issue of OST 1.11.16 approved on April 8, 1981, required that the leakage be measured when the plant was in Mode 2 or 3 with RCS pressure at about 2200 psig. The original test contained no acceptance criteria other than determining the leak rate. A subsequent revision effective on February 12, 1982 added leak rate acceptance criteria as contained in the technical specification, but changed the surveillance tests applicability to Modes 1 thru 4. A further revision approved on May 21, 1982 again changed the testing requirement to Mode 5. The inspector reviewed the Onsite Safety Committee meeting minutes (September 17, 1981 and March 29, 1982) that reviewed the above revisions, but could not determine why these specific changes were implemented. From the data obtained on the December 20, 1984 test with reactor coolant system pressure at about 350 psig, the inspectors determined that the leak rate data for the RCS pressure isolation check valves was within acceptable limits when adjusted to the functional maximum differential pressure of 2235 psig. Hence, no limiting condition for operation appears to have been violated.

Inspector review of the completed copies of OST 1.11.4 identified problems with the test conduct. The specified acceptance criteria of accumulator check valve leak tightness automatically meets the requirements of IWV-3420, as any modification of an allowable observed leak rate of zero gpm to the function maximum differential value is still zero leakage. However, the method used to measure the leakage does not appear to meet the requirements of IWV-3420 in that the OST first requires measuring back flow on the accumulator test line to the RWST, and if any is observed, then the line is isolated to determine equilibrium pressure. The intent appears to be that if the line pressure does not approach RCS pressure within a reaonable amount of time, then the check valves are properly functioning. However, the OST only requires the RCS pressure to be greater than or equal to 800 psig (normal operating pressure is 2235 psig). Actual test pressure is not recorded anywhere. The inspector noted that for each past test of the accumulator check values, a flow indication of about 5 gpm was recorded, and the equilibrium pressure criteria was always used to justify test completion. The failure to measure the accumulator check valve seat leakage in accoreance with IWV-3420 is another example of a violation of TS 4.0.5 (334/85-02-01).

(7) At about 1:50 p.m. on February 15, 1985, a feedwater anomaly caused by an opening of the condensate pump discharge recirc valve occurred during technician work on the condensate instrumentation system. This caused a reduction in total feedwater flow to the steam generators which necessitated a manual power reduction of about 320 MW. After control was restored, power was returned to normal. The inspector reviewed instrumentation charts of critical parameters to verify that no safety limits were violated. During the transient, a minimum pressurizer pressure of about 2050 psig was recorded for a duration of less than five minutes. Technical Specification 3.2.5, DNB Parameters, allows operation with pressurizer pressure less than or equal to 2220 psia for up to two hours before thermal power must be reduced to less than 5% within the following four hours. This specification was met.

Review into why administrative controls did not prevent the unexpected operation of condensate pump discharge recirc valve while the plant was operating is an open item (334/85-02-05).

c. Plant Security/Physical Protection

Implementation of the Physical Security Plan was observed in the areas listed in Paragraph 3a above with regard to the following:

-- Protected area barriers were not degraded;

-- Isolation zones were clear;

-- Persons and packages were checked prior to allowing entry into the Protected Area;

-- Vehicles were properly searched and vehicle access to the Protected Area was in accordance with approved procedures;

-- Security access controls to Vital Areas were being maintained and that persons in Vital Areas were properly authorized;

-- Security posts were adequately manned, equipped, and security personnel were alert and knowledgeable regarding position requirements, and that written procedures were available; and

-- Adequate lighting maintained.

No inadequacies were observed.

d. Radiation Controls

Radiation controls, including posting of radiation areas, the conditions of step-off pads, disposal of protective clothing, completion of Radiation Work Permits, compliance with Radiation Work Permits, personnel monitoring devices being worn, cleanliness of work areas, radiation control job coverage, area monitor operability (portable and permanent), area monitor calibration, and personnel frisking procedures were observed on a sampling basis. No inadequacies were noted.

e. Plant Housekeeping and Fire Protection

Plant housekeeping conditions including general cleanliness conditions and control of material to prevent fire hazards were observed in areas listed in paragraph 3a. Maintenance of fire barriers, fire barrier penetrations, and verification of posted fire watches in these areas was also observed. No inadequacies were noted.

f. Chemistry Sample Program

The inspector reviewed the plant chemistry sampling program that is required by portions of the BVPS Technical Specifications, to verify that sampling frequencies and sample results were within acceptable limits, or corrective action was taken to resolve out-of-specification analysis. The following data pertaining to the reactor coolant system, steam generators and ESF related systems was reviewed for the period of January 4 - 31, 1985.

-- Reactor Coolant System; O_2, F, Cl and activity (TS 3.4.7 and 3.4.8)
-- Steam generator activity (TS 3.7.1.4)
-- Safety injection accumulators boron concentration (TS 3.5.1)
-- Boron injection tank boron concentration (TS 3.5.4.b.1)
-- Refueling water storage tank boron conentration (TS 3.5.5)
-- Boric acid storage tanks boron concentration (TS 3.1.2.7 and 3.1.2.8)

The inspector noted that daily chemistry log sheets considered the analysis of the boron concentration in the boric acid hold tank (BR-TK-7) a technical specification required analysis. The January 26, 1985, results indicated that BR-TK-7 was out of specification low at 6743 ppm versus the required 7000 ppm minimum. Subsequent action returned it within specificatior on January 27, 1985.

The inspector discussed this requirement with plant chemistry personnel, who indicated that the data sheet reference to TS 4.1.2.7.a.1 and 4.1.2.8.a.1 was due to the fact that BR-TK-7 was included as a source of borated water in the total plant inventory calculation performed by OST 1.7.8, Boric Acid Storage Tanks and RWST Level Verification.

The General Design Criteria of 10 CFR 50, Appendix A, requires that safety systems such as the reactivity control system be designed to assure that the affects of such natural phenomena as earthquakes, do not result in the loss of the safety system. It is further required that the systems will function during anticipated operational occurrences such as a loss of offsite power and reactor scrams. The boric acid hold tank, BR-TK-7, and its associated pumping system, BR-P-11A and 11B, are not seismically qualified components and are not considered QA Category I by the BVPS Unit 1 Operations Q.A. Manual. The power supply to BR-P-11A and 11B is not from a Class 1E emergency power system. As such, the boric acid inventory of BR-TK-7 should not be included in the total volume required by Technical Specifications 3.1.2.7 and 3.1.2.8.

Technical Specification 6.8.1, Procedures, requires the establishment of procedures for surveillance and test activities of safety related equipment. The failure to specify use of only QA Category I components in surveillance tests used to meet the boric acid injection reactivity control system minimum volume requirement is a violation (85-02-02).

On two instances; December 15 and 23, 1984, it initially appeared that the volume in BR-TK-7 was used in meeting the applicable technical specification LCO. Further inspector review of operating log sheets and NCO logs indicated that data was incorrectly recorded on OST 1.7.8, and minimum volume requirements were actually met by using only CH-TK-1A and 1B.

4. Engineered Safety Features (ESF) Verification

The operability of the boric acid reactivity control portion of the CVCS during the week of February 11 - 15, 1985, was verified by performing a walkdown of accessible portions that included the following as appropriate:

(1) System lineup procedures match plant drawings and the as-built configuration.

(2) Equipment conditions were observed for items which might degrade performance. Hangers and supports were operable.

(3) The interior of breakers, electrical and instrumentation cabinets were inspected for debris, loose material, jumpers, etc.

(4) Instrumentation was properly valved in and functioning; and had current calibration dates.

(5) Valves were verified to be in the proper position with power available. Valve locking mechanisms were checked, where required.

(6) Technical specification required surveillance testing was current.

No violations in addition to (85-02-02) were identified.

5. Surveillance Activities

To ascertain that surveillance of safety-related systems or components is being conducted in accordance with license requirements, the inspector observed portions of selected tests to verify that:

a. The surveillance test procedure conforms to technical specification requirements.

b. Required administrative approvals and tagouts are obtained before initiating the test.

c. Testing is being accomplished by qualified personnel in accordance with an approved test procedure.

d. Required test instrumentation is calibrated.

e. LCOs are met.

f. The test data are accurate and complete. Selected test result data was independently reviewed to verify accuracy.

g. Independently verify the system was properly returned to service.

h. Test results meet technical specification requirements and test discrepancies are rectified.

i. The surveillance test was completed at the required frequency.

The following in-progress tests were witnessed by the inspector:

1. OST 1.1.7, Manual Reactor Trip Test, January 24, 1985.

2. OST 1.24.4, Steam Turbine Driven Auxiliary Feed Pump Test, January 24, 1985.

No discrepancies were noted.

6. Maintenance Activities

The inspector observed portions of selected maintenance activities on safety-related systems and components to verify that those activities were being conducted in accordance with approved procedures, technical specifications and appropriate industrial codes and standards. The inspector conducted record reviews and direct observations to determine that:

-- Those activities did not violate a limiting condition for operation.

-- Redundant components were operable.

-- Required administrative approvals and tagouts had been obtained prior to initiating work.

-- Approved procedures were used or the activity was within the "skills of the trade."

-- The work was performed by qualified personnel.

-- The procedures used were adequate to control the activity.

-- Replacement parts and materials were properly certified.

-- Radiological controls were properly implemented when necessary.

-- Ignition/fire prevention controls were appropriate for the activity.

-- QC hold points were established where required and observed.

-- Equipment was properly tested before being returned to service.

-- An independent verification was conducted to verify that the equipment was properly returned to service.

Activities inspected were:

1. Maintenance on MOV-SI-863A, LHSI discharge to charging pump suction, on January 14, 1985. The valve initially failed to stroke open and the limitorque operator was replaced. Subsequent stroke testing was adequate to prove operability.

2. Recalibration of Loop 1 RTD (T-RC 412) per 18 month surveillance test on January 18, 1985, after an Overpower Delta Temperature spike.

3. Repair of MOV-RS-156B, outside recirculation spray pump discharge valve, on January 31, 1985, after a shear pin failure on the rod extension. The valve was successfully stroke tested and left in its normal open alignment.

4. Replacement of outside recirculation spray pump 2B seals on February 4, 1985, due to excessive leakage. Normal pump surveillance testing and lack of a recurring low seal pressure alarm proved repair adequacy.

No concerns were identified.

7. Periodic Reports

On January 30, 1985, the inspector was informed by the licensee of an error in the Semi-Annual Radioactive Effluent Release Reports, required by TS 6.9.1. Apparently, the method used to calculate the amount of tritium released to the environment through gaseous pathways had been incorrect by a factor of about 10 E3 since plant startup. The error was discovered during development of a computer program used to enhance the offsite dose projection capability. According to the licensee's representative, back calculations using the revised methodology indicated that the TS limits for tritium have never been exceeded. The inspector brought this to the attention of Regional specialists, and detailed followup will be conducted during the next NRC inspection of the environmental area. This is Unresolved Item (85-02-03).

8. IE Information Notice Review

IN: 84-86, Isolation Between Signals of the Protection System and Non-Safety Related Equipment, was issued to alert licensees of a potential problem whereby a single relay failure in non-safety related multiplexer equipment could affect safety instrument current loops. This can occur because the buffer device in the safety related instrument loop inputs to the plant monitoring computer, isolates only the "high" side of the electrical signal and not the "low" side, or ground. Licensee review of this item determined that the concern was not applicable to BVPS because the signal isolators (Model 110 and 118) do in fact isolate both the high and low sides of signals fed to the SSPS and 7300 series process instruments. Hence, this problem does not appear to be generic to the Westinghouse designed instrumentation systems.

9. Exit Interview

Meetings were held with senior facility management periodically during the course of this inspection to discuss the inspection scope and findings. A summary of inspection findings was further discussed with the licensee at the conclusion of the report period.